

AVIATION

The Oldest American Aeronautical Magazine

MAY 19, 1924

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Air Power afloat—Aircraft Squadrons, Scouting Fleet, anchored off Culebra Island, Porto Rico

VOLUME
XVI

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20

SPECIAL FEATURES

THE STOUT AIR PULLMAN

MODERN RADIATORS FOR AERO ENGINES

THE AIR SERVICE'S CENTRAL AMERICAN FLIGHT
DUPLICATION OF FUNCTIONS IN AERIAL COAST DEFENSE

GARDNER PUBLISHING CO., INC.

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PUBLISHER'S NEWS LETTER

The publication of the figures showing the cost of our Government Air Service has brought much press and the severest criticism. The criticism appears to be based on the assumption that if Congress and the public know that we are spending so much for aviation, there will be a cutting down of appropriations. As our friendly correspondent writes:

"However, the shock of my life came when I read your article about the costs of the Air Service. How in the world did you come to do it? If there is one section which would come nearer to preventing any future increases in air appropriations than the areas taken by you, I cannot conceive of what it could be, because you played it up to make the case look as bad as possible. Very likely the result will be that next year, instead of \$12,000,000 for running the Air Service, it will be \$5,000,000, all of which will be necessary for the operation of the Air Service. Therefore, there will be no money left for the aircraft manufacturers."

The latter was not from anyone connected in any way with the aircraft industry, but from a man who looks the matter from the government point of view. Such criticism deserves a very frank answer and our readers will naturally be interested in our point of view.

During the war, and even since, civilians have been bitterly criticized for their part in the "billions dollar aircraft waste." Only last month the Department Commander of the American Legion of New York sent out the following statement to members:

"Over a billion dollars was paid to contractors to supply aircraft and yet not one airplane flew over the Western Front. These debts the Government paid and some people became rich."

General Pershing, in a signed article published in *Cavalcade* (February, 1923), gives the net cost of War Aviation as \$363,131,113.50, after deducting the value of funds and supplies we stocks on hand. Of this a comparatively small portion went for the purchase of airplanes in the country.

The point we believe to be of the greatest importance is that since the war the Government has spent almost as much for aviation as it did to that supreme effort, and still we act without adequate numbers of airplanes. If the numbers fell down in production during the war period, we believe that the officer who has had the spending of the appropriations should let the taxpayers and citizens know just how they are carrying out our air defense. They should tell the restaurants under which they operate. As the figures which we

printed were those given to the Appropriations Committee of Congress, we cannot believe that their reproduction in an avocation paper which goes to those who have the best interests of航空 at least one result in halving the appropriations next year. Rather, it will cause discussion and show the great need for more constructive air policy, instead of the haphazard methods now in vogue.

Concerning increases of appropriations, we feel certain that with the present attitude of President Coolidge and Congress there is little hope for increasing appropriations for aircraft. We certainly do not share in the belief that Congress should be told that \$57,000,000 is being spent for aviation while the public is given the impression that it is only \$28,000,000, and that Congress will not give enough money to support the services and purchase aircraft as well. It is apparent, with air limitation conferences in prospect, that every country will wish to those that air predominance in the least expensive and most efficient form of defense. To do this, Congress, the public and particularly those interested in aviation should know how much money is being spent and how it is being used. For this reason, *Aviation* feels that instead of endangering future appropriations, it has shown how inadequate is our air force and how vitally necessary it is to spend the money that is available to the best advantage.

As to making "the case look as bad as possible," we say very seriously that if it had been our purpose to do that, we would not have confined ourselves to the figures and statements made to Congress. We do not believe, in making out a bad case for the Air Service. But we do believe that the facts that are given to Congress by officers should be discussed in the avocation press. Our correspondent appears to feel that if appropriations are reduced there will be no money left for the aircraft manufacturers. That appears to be the case at present, with practically all the companies that do not or cannot run a quarter capacity base.

To put it directly, the purpose of *AVIATION* for eight years has been to fight for the cause of aviators, and to put the interests of the art and science and industry above all other considerations. That all the older of our avocation papers have fallen by the wayside indicates that this policy has been sound. And our readers can be assured that regardless of criticism, *AVIATION* will continue to give them the facts of aviation in as constructive a manner as possible. —L.D.G.

MAY 19, 1924

AVIATION

Published every Monday

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No. 20

AVIATION

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MAY 19, 1924

Aircraft Expenditures

In line with the present deductions made by AVIATION regarding the use to which aeronautical appropriations have been put in the last few years two statements have been made recently that have a direct bearing on the writer:

Capt. David S. Stetson, secretary of the Aeronautical Board, which is composed of representatives officers of the Army and Navy Air Services, made the following statement before the Appropriations Committee:

"I am afraid the way we are going that our money is going only to installations for using strength. That is what I am afraid of. Instead of putting in one installation and more, we are putting in two installations and dividing up our money so that neither one of us is getting enough aircraft to do anything with."

Admiral Robert E. Coontz, Commander of the United States Fleet in his statement issued last week regarding the material condition of the Fleet, does not lay the blame on the inefficiency of appropriations, but places a considerable part of it in the excessive overhead at Navy Yard, which he declares, "eats up the money available without putting a sufficient portion of it into ships."

The method of using appropriations is evidently being heavily under discussion in the statements continually made by many officers of both Services, when they talk in public, to the effect that Congress is to blame for the deplorable condition of the country's Military and Naval Services. Congress has already an efficient and ruling out where the money is appropriated goes, and statements like the above will only tend to further agitate.

"Constructive Economy" would appear to be one of the possible slogans of President Coolidge's campaign, and the idea will have the hearty endorsement of the country.

The same money is needed for our air defense as is obvious from the condition the Air Services are in—but first there should be the best use made of the present funds. When this is settled, then more funds can be asked for and secured with a less suspicion of excesses.

An Important Question

CONGRESSMAN BRITZEN'S Resolution asking the Secretary of the Navy to furnish the House of Representatives with information about the Navy contains a question concerning aviation that seems to be extremely pertinent to this time.

Congressman Britzen asks: Is it a fact that America leads the world in the theory and science of aviation, and yet trails behind Great Britain, France and Japan in aeronautical production for national defense?

Whether or not we lead the world in aeronautical engineering and research may be disputed, but if world records are

any indication of superiority, then our American aircraft designers can at least have a strong reason for making such a claim.

There can be no doubt that the United States is behind France and Great Britain in actual aeronautical service equipment and in combatant air units. We are not sufficiently informed regarding the separation of the Japanese Air services to pass an opinion, but the mere taking of the question would indicate that Nippon is, if not ahead of us, at least catching up rapidly enough.

The real heart of the problem is the lack of modern service aircraft. This is due largely in two causes. First, the administration of appropriations for this purpose, and second the uncertainty of the officials in charge as to what kind of equipment they want. Millions of dollars have been spent on engineering and research work, so that after five years of the work there should be a definite idea as to what constitutes an up-to-date service plane under present production possibilities. In other words, it is infinitely preferable to settle this year on a few "excellent" machines and get them in production so the squadrons can be equipped with them than to postpone the work until next year on the wholly ill-founded hope of getting "a super-excellent" surprise. For then the excellent airplane will have become old, "outmoded" and incongruous will suggest waiting until the "really excellent" airplane becomes available in a year hence. It is obvious that such a policy will never give us modern service aircraft in sufficient numbers.

Major Martin's Return

THE happy termination of the adventure which Adm. Major Martin and Sergeant Hartney after the Alaska wilderness had concluded them up for twelve days is a good signary for the ultimate success of the American World Flight. To have survived a crash into a swamp in foggy weather, and then to have tramped for seven days back in civilization under such severe weather conditions shows a physical and mental hardiness which are typical of the Air Service. Major Martin and Sergeant Hartney have won warmly at the Air Service's "never-say-die" spirit.

A Strong Rejoinder to Come

AVIATION for the task at hand has had to spend over a score of issues the digest of the House Hearings on Air Service legislation, and in so doing must have appeared to give the Army attack on the Navy undue prominence. This was because the complaints are always given the first opportunity to state their case. The rejoinder of Captain Stetson, which appears in this issue does the like of Adm. Moffitt and this will be published in the next issue.

the pilot's compartment form two bulkheads, while the dashboard forms a third door between the passenger compartment and the engine, so that very little engine vibration or sound gets back to the passengers.

The passenger compartment is also enclosed to prevent noise from traveling back to the cabin and further reflected from the metallic walls of the engine.

The engine installation is very accessible. The base of the engine is a main support which carries every weighty gear and reduces the installation and at the same time protects the structural work far enough from the engine itself so that one can reach it and get at everything.

Poison Plant

The engine is a standard Le Rhône 110 hp model but fitted with a twin cylinder air-cooled which is the latest development at the Air Service. New heavy torque gears have also been fitted, and the new type pump "Deter" distributing system.

The generator is wound for 12 volts for a large battery which not only takes care of ignition but a larger electric self starter with which the plane is fitted, the fuel system and controls being the same.

A gasoline system includes four circulation tanks of 75 gal capacity, each placed out in the wings 12 ft apart and well above the engine so that gravity feed is used without the complication of pump or air pressure. All gas lines are flexible coated with metal connections inside the rubber hose to prevent any parts working loose. All gas lines in the engine area are wound with wire and clamps to prevent vibration.

The engine is built with maximum strength and durability as well as the engine oil system. The oil tank is supported under the engine just forward of the pump with a line running forward to join with a copper pipe which runs through beside the bottom part of the water balance giving about 4 ft of space inside the water. In this way the oil is warmed in winter and cooled in summer to approximate engine temperature.

Landing Gear

The landing gear is of the drooped type, with no axle or wheel to catch on rocks and brush and thus make trouble. The wheels have an 8 ft spring and spring independently with

12 in of sprung action on top of the cushioning of 6 in the rear of 30 in diameter. The shock absorber cords are arranged externally on the fuselage at the top of the chassis tubes, and work with a sliding guide plate.

The landing gear design is one of the reasons for the extreme softness with which the plane flies.

The plane will be made with either wheels or floats, depending on the service in which it is to be used.

Provision for Mail and Freight

The plane is particularly designed with reference to the carrying of mail along with express money, a special compartment for mail being provided with a limit of 100 lbs. The plane will take approximately 5 mail bags.

The Island Air Pollution is an enlargement of the "Stearman" which has been modified by the addition of a motor driven propeller and the new type pump "Deter" distributing system.

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CHARACTERISTICS OF THE ISLAND AIR FULMAR		
Span	48 ft	4½ in
Length overall	34 ft	10 in
Width overall	10 ft	10 in
Height overall	10 ft	10 in
Wing area	260 sq ft	
Horizontal stabilizer	10 sq ft	
Vertical tail area	10 sq ft	
Propeller	3 ft dia	
Flying landing gear	12 ft dia	
Motor	Le Rhône 110 hp, liquid	
Oil tank	10 gal	
Water容量	10 gal	
Water容量 with water	10 gal	
Gasoline容量	10 gal	
Fuel tank	10 gal	
Gasoline tank	10 gal	
Passenger容量	4	
Passenger容量 max speed	3	
Passenger容量 min speed	2	
Passenger容量 at ground	2	
Service ceiling	10,000 ft	
Service radius	100 miles	
Time to 10,000 ft	12 min	

A Pioneering Flight through Central America

Navigation Log of the Army Air Service's Flight from Panama to Guatemala

The Army pilots from France Field, Panama Canal Zone, who left that field on Feb. 4 not on a flight to Central America, but on a P-12 flight to San Salvador, were the first to fly over the Isthmus of Tehuantepec. The trip was especially made north where it is considered that the flight covered an area hitherto unknown from the air and that the landing fields were not all that could be desired.

The Personnel

The following officers and enlisted men made up the flight party: Lt. Col. Frank W. Miller, Capt. A. W. Smith, Lieuts. L. H. Morris, F. W. Warren, L. W. Mills, F. P. Allard, George L. E. Crosser and W. Hauser.

Lieutenant Morris, Navigation Officer of the flight, submitted the following official report from the navigation stand-point of the expedition:

All references to distances, landmarks, etc., in this report are based upon the Rand McNally standard map of Central America, which is approximately 1:1,000,000 scale. No compass routes are given for the many short legs of the country flown over was very unscientific and it was found best almost every leg of the flight to make detours around the highest peaks and points rather than to fly a compass route. A German compass map of Central America, pre-

pared by Alfredo Völcker and copyrighted by Wilhelm C. Röhrmann, Stuttgart, was found to be quite accurate and was profitably studied in connection with the Rand McNally map.

Mountains the Map Missed

The first leg of the journey from France Field to Tocai, Peravia, via Chame Pass, is approximately 225 mi. and is somewhat difficult. Starting from France Field, the route is shown south across Cerro La Blanca, along the ridge, and then west to the village of Tocai. From Tocai the route goes west along the Chame Pass, which is really the end of the Volcán Mountain Range. Travelling the pass and then turning to the right along the main range of mountains to within 10 mi. of Darién. On a clear day it is possible to see a small but extremely bold mountain range 30 to 40 mi. to the north of Darién. This mountain is not marked on the map but is easily recognizable and may be the "Cerro de la Plata" mentioned in the old maps. The pass is about 10,000 ft. high and a long stretch of the pass is a few thousand feet above sea level, with a few narrow gullies, and is situated between the down and the ridge. It is approximately sea level, but only 11,000 ft. in the pass and the take-off is over the town. Even a DH with extra gas tanks, or otherwise heavily loaded, would have trouble. Particular care should be taken in landing.

A field was located and established here as at La Chame, which is a narrow valley. The mountains, located in much higher country, are approximately half way between San José and Guatemala City.

on this range, leave the road low to the left passing over Uvita and Zarcero, both of which are in fair country, but after leaving the latter place it is very rough, with high peaks to the right. From 5000 ft altitude at this point Lake Yojoa, which need not be crossed at the latter end of the route, 7000 to 8000 ft. high, with isolated peaks much higher and the entire range is cloud-capped almost every day in the year. Finally, the Atlantic coast has twice the annual rainfall that the Pacific coast has, and during the entire wet season, which lasts eight months of the year, the Atlantic coast is usually dry.

From David to San José

From David to San José, Costa Rica, a distance of 160 mi., is to be had to the left or south of the surface course out of Tocai. Flying generally, although not directly, north of the coast, follow the coast line of Costa Rica. The road follows the coast line from here to the Puerto Viejo, then turns sharply to the right and follows up the valley to San José. In weather is clear, leave the coast at Quirós Puerto. The ridge is largely undivided, and there are a large number of towns, so care must be taken to select the right one, which is the first town on the ridge. The ridge drops off to the right, crosses the river, and then turns sharply to the right again. The field is long and narrow, but has with the ridge and the wind always blows either up or down the ridge. It is a sort of public playground just on the edge of the town, and the first thing to be done is to approach the town from the ridge. There are no dangers on the road to San José, but the road is not good. The road to San José is the best, but the road to the coast is also good, and the road to the right of the field is also approachable from the south. It is very rough. The elevation is 2000 ft. and good landing can be made thereon by all types of planes in the new days, however, the air is quite rough. No planes to land this flight except very near San José and very near David.

It is approximately 360 mi. from San José to Frans Field down the coast on the return flight the Martin Brother made the trip in 1 hr. 30 min., but this trip is not recommended for general use, as there is not a landing field in the entire 360 mi. and rain and bad weather are much more frequent over this route than by the way of David.

Bad Flying Country

Driving from San José to Managua, Nicaragua, a distance of 200 mi., it is possible to get through a pass near San Pedro at an altitude of about 5000 ft. and up the ridge through the mountains, which are mostly high and rugged, with the pass, and there is much chance of rain in this section. The mountains are very high all the way up to Lake Nicaragua, so a general rule is to keep a course between the Volcán Mountains and the Gulf of Nicoya up over Liberia Bay which route takes you over a little open country. From San Pedro Bay here over toward the shore of Lake Nicaragua, turn east up on the ridge to the town of San Juan and then follow some general country up on to Apoyo.

There are two active volcanoes on Cerro Apoyo, the first one being on the ridge—and another smaller one over Apoyo—not shown on the map—the ridge and the town are about 10,000 ft. high and the terrain looks very rugged. Cerro Apoyo is located in a large valley or plateau basin at an altitude of 9000 ft. with sand flat and highly cultivated country adjacent. A good landing field could be established, but a landing is not advisable with the field in the open country.

The following is a time log of the trip for the Muster Brother which, owing to the bad weather and the excessive amount of climbing en route of many of the flights, averaged around 75 mi./hr. airspeed for the trip up, and we landed at a strong headwind en route of the return journey.

From France Field to San José, 2 hr. 45 min.; to Managua, 2 hr. 15 min.; to Guatemala, 2 hr. 20 min.—return trip—from Guatemala to San Salvador, 2 hr.; to Managua, 3 hr. 45 min.; to San José 3 hr. 45 min.; to France Field, 3½ hr.

of that range, leave the road low to the left passing over Uvita and Zarcero, both of which are in fair country, but after leaving the latter place it is very rough, with high peaks to the right. From 5000 ft altitude at this point Lake Yojoa, which need not be crossed at the latter end of the route, 7000 to 8000 ft. high, with isolated peaks much higher and the entire range is cloud-capped almost every day in the year. Finally, the Atlantic coast has twice the annual rainfall that the Pacific coast has, and during the entire wet season, which lasts eight months of the year, the Atlantic coast is usually dry.

Dredging a Dead Volcano

The shortest flight of the trip, 110 mi., from San Salvador to Guatemala City, Guatemala, is to some respects the most difficult, as it is necessary to pass 5000 ft. altitude to observe safety the mountains near the coast line of Costa Rica, and then never return to them. In cloudy, rainy weather, it might be best to follow the shore line to Liberia and then follow the railroad into Guatemala, but it is almost twice as far. The weather being fine, however, the flight up and the return flight were both made direct. San Salvador is located at the foot of the Volcán Barú, which rises to the sky on the right, and the town is on the left shoulder of the volcano, and well to the right hand side of the volcano cone apex. The field is long and narrow, but has with the ridge and the wind always blows either up or down the ridge. It is a sort of public playground just on the edge of the town, and the first thing to be done is to approach the town from the ridge. There are no dangers on the road to San José, but the road is not good. The road to the coast is the best, but the road to the right of the field is also approachable from the south. It is very rough. The elevation is 2000 ft. and good landing can be made thereon by all types of planes in the new days, however, the air is quite rough. No planes to land this flight except very near San José and very near David.

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Modern Radiators for Aeronautical Engines

The New Lamblin Radiator Described

Radiators for aeronautical engines, while in principle identical to those used in motor cars, have to endure certain requirements which are peculiar to aircraft operation. These requirements are light weight, maximum evaporation, good streamline form and durability.

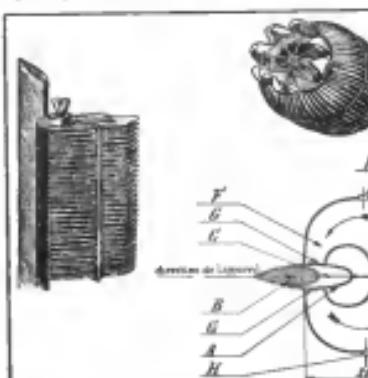
Requirements of Airplane Radiators

The heat generated by a modern airplane engine, which the radiator must remove, is proportional to the temperature of the surrounding air, its speed and the density of the surrounding air. The average value of existing water radiators approximates one quart per horsepower minute. The radiating capacity of a radiator is dependent on numerous factors. Generally speaking, it varies in proportion with its surface area, the material, size and position of the water employed, the number of fins, the number of rows of fins, the velocity of air passing over the radiator, the temperature of the water, and the speed of the air passing over the radiator. The greater the number of fins, the greater will be the radiator's capacity.

For a given radiator, the radiating capacity varies with the density of the surrounding air, with the difference in temperature between the surrounding air and the radiating water, and, finally, with the ratio of the cross section of the tubes and the speed of flow of water and air. Thus brief summarization, when considered together with the numerous other factors involved in the construction of airplane radiators, will give the reader an idea of the difficult problems involved in the construction of airplane radiators.

The three principal types of radiators used with aeronautical engines are: (1) the wing radiator, (2) the streamlined and flat type radiator, and (3) the honeycomb radiator.

The wing radiator is an American development which has given a striking proof of its excellence in the 1923 and 1924 Pulitzer Trophy races, where the Curtiss and the Wright racers were its conquerors. The type of radiator was described in the previous article of this, and, as far as I know, no further information can be obtained.



Different types of Lamblin radiators for aircraft engines.—The top center sketch shows the streamlined type, with the cluster apex, the outer shroud and the two diagrams show the new flat type radiator. Key to diagrams—A, manifolds; B, shell; C, partitions dividing the manifold; D, inlet and outlet pipes; E, cooling plates; G, water inlet and outlet connections; H, collector for the outlet of water and air; I, cross-plate; J, bristle strainerbox; K, drain plug. Dimensions in millimeters

May 10, 1924

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the water. D and E are fixed to the end of the manifolds (shells or brackets according to the position of the radiator) and can be streamlined by a fairing extending from the manifold. The fins F are welded on the manifolds so that their tips coincide with the line of flight. They communicate with the manifolds by pressed ports G. The cross-members H allow the radiator to be tilted at an angle of 15° for refilling.

The external shroud forms a tube having the upper part removable to the seat. The radiator is easily mounted on the seat by means of suitable bolts, nuts and fittings.

The water circulation in the radiators is in the form of a loop. The portions of these negotiate are connected by riveted and welded bands; their section is brought to the same as the fins.

As compared with the 1923 model, the 1924 model offers several important advantages. In the first place, parasite resistance is greatly reduced, not only because of the excellent streamlined form of the radiator, but also because of the relatively large separation and smaller width of the fins. Furthermore, the ratio of the air to water weight of the water cooler is reduced about 20 percent, thus increasing the capacity as the radiator increases. Nevertheless, the radiating capacity has remained the same as before, which is due to the fact that the radiating surface is not only wholly submerged by a high speed air stream, but also because the air stream is very clean and without any turbulence.

The introduction of parts of aluminum is particularly favorable for saving the radiator on weight, and for repairs and replacements are furthermore very valuable features of that radiator.



Léonard Pichot d'Orly, of the French air force, pilot of the Paris to Tokyo flight.

The Second Division of the flight leads from Chongkow to Khotchow Bay, on the island of Formosha, across a distance of 360 mi over the water.

American World Flight

After having been missing since April 30, when they took off from Chupak landing field at Dutch Harbor, Maj. Frederick L. Martin and Capt. George A. L. Harvey reported to radio station Patrick, Chief of Air Service on May 30 that they had safely arrived at Port Moller, an isolated point on the Hering River, in the Aleutian Peninsula. Major Martin's report reads as follows:

"Crossed oceanic continent in fog at 12:30 a.m. Neither land but ship land words. Our existence due to concentrated food and water. Arrived at a tanager's estate, unhampered point of Port Moller Bay, averaging of 70% reduced. Found 100 miles from land. Weathered three days. Waiting instructions here."

The report was sent from the Army radio station at Port Moller which is about 120 mi on surface distance from Chupak to Dutch Harbor, and was relayed there by the naval communications service via Hawaii to Washington. The arrival of the men's arrival was first reported as a scratch in the War Department from the Commander of the Coast Guard patrol force in Alaskan waters, who reported the two men on good health.

Captain Patrick, after a conference with the Secretary of War, sent this telegram to Major Martin:

"We rejoice and thank God that you are both safe and well. Continue to you undivided. You have proved yourself. Still wait to receive your flight. Great advantage for you to exchange stories by going home. Your return to the States will repeat to us here without delay. Plans to send you East to receive flight at furthest convenient port from which you can complete the journey with the rest of your associates."

Major James has been loaned to assemble at Langley Field a new Douglas World Cruiser from the stores available. It is planned to have Major Martin return his command soon, when he goes, and probably to India.

The three world cruisers now under the acting command of Capt. Lowell H. Smith flew May 9 from Manzan to Sasebo, on the island of Amak, a distance of 320 mi, which took them 10 hr and 40 min. This marks the completion of the first of the seven distances taken in the American World Flight of 27,000 mi. The total distance flown by the planes Chicago, Boston and New Orleans from Manzan to Chicago is 4,000 mi, which was covered in 41 hr 50 min flying time, while the total elapsed time was 516 days.

Paris to Tokyo Flight

Léon Pichot d'Orly, Capt. Pichot d'Orly, and Georges Vion, mechanics, of Paris to Tokyo flight, started from Agosto, Italy, on May 5, 1924, from there to Calcutta on May 7. Their flying time from Paris to Calcutta was 21 hr 30 min., and the elapsed time for the 6,000 mi. distance twelve days.

The severe Indian heat, which deteriorated the fabric of the dirigible's envelope, has considerably slowed down the Japanese progress. One day was spent at Agosto, preparing the way for the next day's race to Calcutta, especially for the same reason, before the flight was resumed. On May 8 d'Orly and Vion left off from Calcutta, heading in by dirigible to Bangkok, Siam, a distance of 1,200 mi. However, when the plane was a hundred miles beyond Bangkok, Burma, the engine became enveloped, and so there was no choice but to land. The two men, however, were able to return to Bangkok, where he landed safely in a field among cows and football goal posts. The distance from Calcutta to Bangkok is about 750 mi.

On May 16 the two Frenchmen passed on to Bangkok, a distance of 280 mi, and on the following day they arrived in Bangkok, Thailand, covering the last 100 mi distance of their trip in 8 hr. From Bangkok to Rangoon, a distance of 700 mi, the different source of the intense heat which evaporated the water in the radiator and also caused trouble in the carburetor. On the leg from Bangkok to Rangoon three stops were encountered which forced the airmen to rise to an altitude of 10,000 ft.

The Japanese planned to fly from Bangkok to Rangoon direct, but he changed his itinerary apparently to avoid flying over the vast virgin forests of Indonesia, which would have meant a non-stop flight of 800 mi. His total elapsed time from Paris to Rangoon was seventeen days, out of which eleven were flying days, for a distance of 7,000 mi.

The remaining stages of the Paris-Tokyo flight are: Hanoi, French Indochina (750 mi); Tientsin, China (750 mi); Shanghai, China (750 mi); Tachikawa, Japan (1,400 mi), and Tokyo, Japan (500 mi).

Flying Time of French Air Force

Flight of the French army air service for 1923 in total of 550,000 hr, as against 222,000 hr in 1922 and 144,456 hr in 1921. The aggregate distance covered was approximately 13,000,000 mi in 1923, 16,000,000 mi in 1922, and 8,375,000 mi in 1921.

AIRPORTS AND AIRWAYS

Long Island News

Fred Goldner, manager of the Carter Metropolitan Airlines Co., has a new operating certificate, separate from its stations at Port Washington, L. I., and Palm Beach, Florida, a remarkable eight weeks recently by one of the Company's flying boats.

After the Southern season was over, a Seafair which the Company had been operating at Palm Beach for the last four years was sold to the Frank A. McBride of Elgin, Ill. Mr. McBride has had many years on the flying boat line, also is a member of the Board of Directors of Chicago Webster, veteran pilot of the Company, should fly the ship to Elgin. It is over 2,000 mi. from Palm Beach to Elgin, and it was planned to make the trip in seven days.

The first day's flight was right across Florida, following the coast to Lake Okeechobee, and then on to Caladesiakoski on the West coast. The flight across Florida took about a few hours, but the weather was bad, so the water was dark and the cities obscured by overhanging clouds. The first night was spent at Cedar Key, a little way above Fort Myers. The next day a stop was made at Pensacola, and New Orleans was reached just before dusk, as the flight was delayed by several of rain and fog. During the evening flight up the Mississippi steps were made at Sabine, Cape Girardeau, and Lake St. Louis. The next day of the trip, after a long delay, the Seafair flew to the Missouri, breached off at the Five River and landed at Elgin.

According to Pilot Webster, the Carter K-6 engine did not run more during the whole trip, and not even a spark plug was changed. This is quite remarkable as the motor had already had 600 hr. when the flight was undertaken. The total flying time for the trip from Palm Beach to Elgin was 32 hr. 40 min., cost only \$16 per gallon of gasoline was used.

The Loewen Air Yacht, belonging to Arnold S. Vanderhoff, was put in commission on May 2 for its third flight season. Mr. Vanderhoff made a flight so that the Port Washington to Southampton.

Philadelphia News

The Keystone Aviation School, formerly Chandler Field, shows the usual spruce activity. J. A. Larson's new designation field and seaplane is ready for trial. R. M. McLaughlin, Jr., is very anxious to get going his "crash," the King.

The only Duranti Douglas on the Eastern States, is to be set up and flown on the Great Lakes by H. V. Shantz of the Wisconsin Air Lines, that company having recently bought the plane here.

Charles Waller's Carter boat is being set up in preparation for the annual Lo-Ya-Yacht Club races during June, George E. Price, the owner, who's more or less in charge of the boat, has the boat at Rockport.

An inspection of this station was recently made by several Naval Officers with prospects of opening a Naval Reserve training school here for the Fourth Naval District.

An American Aircraft in Europe

The present all-American aircraft on Europe is still enough to satisfy so many countries and where the ship is piloted by a girl, the newspaper interests deserve special mention. Thus in the case of Miss Eleonor Vreeland of Esmond, who has been touring the French and Italian Riviera but never in a Carter SP-5 flying boat with G-XB engine of which she is the owner and chief pilot, Capt. Paul Mirell, formerly of the Latvian Flying Corps, who taught Miss Vreelandough to fly last summer, accompanied her on these flights in company of assistant pilot.

As no civil aircraft may fly in France or in any country subject to the International Convention without having an international certificate and a registration mark, it is interesting to note that Miss Vreelandough's plane bears the registration mark NC-EVA—which may be a subtle tribute to her aerophaenomena. Miss Vreelandough is expected back to her aerophaenomena this month.

Results of National Balloon Race

The Contest Committee, N.A.A., announces the official results of the National Elimination Balloon Race held at San Antonio, Tex., April 25, as follows:

NATIONAL ELIMINATION BALLOON RACE			
Pilot	Age	Point of Landing	Date
W. T. Van Oosterhout	30	Point of Economy, Kansas City, Mo.	1924
(Champion)		Marshall Co.	
Douglas C. Knapp	44	St. Louis, Mo.	1924
H. H. Thompson	39	Point W. of Marion, Marion Co.	1924
Douglas C. Knapp	44	Point of Safety, Marion Co.	1924
Mal. H. W. Park	32	W. of Marion, Marion Co.	1924
H. W. Anderson	32	Point of Safety, Marion Co.	1924
Douglas C. Knapp	44	Point of Safety, Marion Co.	1924
H. W. Anderson	32	Point of Safety, Marion Co.	1924
John W. V. Vianen	32	Point of Safety, Marion Co.	1924
(Veteran Aerophaenomenon)			
Douglas C. Knapp	44	Point of Safety, Marion Co.	1924
Capt. Edward C. Lewis	32	Point W. of Marion, Marion Co.	1924
Douglas C. Knapp	44	Point of Safety, Marion Co.	1924
B. H. Pfeiffer	32	Point of Safety, Marion Co.	1924
(Pilot Captain)			
Mal. H. W. Park	32	Point of Safety, Marion Co.	1924
L. A. D. McElroy	34	Point of Safety, Marion Co.	1924
C. C. W. Appling	32	Point of Safety, Marion Co.	1924
Douglas C. Knapp, winner			

Our Records Are Slipping

The Contest Committee, N.A.A., is in receipt of official notices from the International Aerophaenomenal Federation that several records have been homologated as follows:

Class C—With and Without useful load altitude—1 try-out. Capt. Hallid, Fokker C4,
Sapiro-Lyon 450 hp. at El Pichon Field,
Barcelona, Spain, Jan. 19, 1924. 18,000 ft.
Class C2—complete—with 200 kg. useful load altitude—(Finsbury) Master Mechanism Bend
Famoco-Gekko Biplane, 2 Stanssen 260
hp., at St. Nagel, April 4, 1924. 3,355 m.

Since the new altitude record with 18,000 kg useful load records the former world record held by Capt. R. L. Pales, the Spanish Air Lines, a new record is needed in this category in accordance with Art. 298 of the FAI regulations.

Italy Experts Aircraft Equipment

The Italian government aviation factory near Rome recently shipped to Spain a large consignment of model equipment which included several catalogues of the SCA type aircraft. An O type aircraft, purchased by the Argentine naval air service, was shipped at the same time from Spain to Buenos Aires. The Argentine naval air service already owns an O type aircraft, which it uses for reconnaissance purposes, and it is understood that the purchase of several large models is now being contemplated.

May 28, 1924

AVIATION

Denton News

By Maxine C. Shuster

Four remarkable flights testing the new search indicator instruments, which were developed by the International Searcher at McCook Field, were made during the last few weeks. The most important was a trip accomplished in five hops from Dayton to San Antonio, Tex., and return by Louis E. H. Barnardis, test pilot, and Navigator Victor Shepard.

This flight hopped off March 27 from Kansas City, Mo., under a strong headwind. The fliers crossed them to stop at Fort Field, Belleville, Ill., where they were delayed two days. On March 29 they went on to Kansas City and prepared for a non-stop jump to San Antonio, 1100 mi. away, headed solely by their compass. The visitors started from Kansas City on March 30 and completed the trip in 6 hr.

After several days at the Texas station during which time Mr. Shepard tested on the application of the new instruments to aerial navigation, the fliers rounded their journey and landed at Madras, Okla. They followed a bee-line course across the circle from there to Durbin, roundabout a trip of 1,000 miles.

The second flight was made a week later by Louis H. C. Denney, of the War Plans section, McCook Field, and Navigator Dorothy Jones, from Dayton to Albany, N. Y., a distance of 220 mi. This flight was made without a map or the use of landmarks as the regular map of the terrain was carried on a small chart to prevent any possibility of an accident. The visitors landed at the Speeder Research Field at Albany which is situated on the middle of the Hudson River. Lieutenant Denney reported that the field was one of the best aerial landing places he had ever seen and recommended it heartily to aviators flying in that district.

During the same period from the War Plans section, Captain Edward C. Lewis, Navigator, and Navigator Dorothy Jones, of the War Plans section, McCook Field, stopped up in Cleveland, approximately 280 mi. to Dayton, in 1 hr. 20 min. They were aided by a 60 mi./hr. gale on their tail. *

Mr. Henry C. N. Mikkelsen, Journeyman of Dayton, and Mr. Edward J. Dugan, Journeyman and general staff at Fort Leavenworth, Kas., were visitors at McCook Field en route to Washington. They flew on June 20th. Cloude. *

John Aldens, Chairman of the Membership Committee of the A.A.A., announced that the national membership continues to increase, although advised by Admiral William F. Fullam, retired, will be renewed again a few weeks in the West. The new directory includes Minneapolis, probable site of the 1925 International Air Show, St. Louis, Kansas City, Indianapolis, Oklahoma City, St. Joseph, Wichita, Denver and Omaha.

Mr. Aldens, who was a member of the membership party that visited the South recently, reported that chapters were formed in each of the fifteen cities visited.

Davenport News

By Ralph W. Conk

A short flight was recently made from Lincoln, Neb., to Wallace Field, Beloitton, Iowa, where two Lincoln-Standard planes carrying on air transportation made the trip at an average speed of 100 mi./hr. during a 10 hr. 45 min. flight.

In the party were Mrs. Wallace G. Land, H. C. Hampton and M. A. Sime of Chicago, purchasers of the two planes, and Peter Steiner and Gould G. Reid, pilots. The planes were being delivered to the field which Mr. Land and his associates have opened at Clinton, as Higgins road just west of town. The planes are built of wood and fabric, giving a flying weight 1200 to 1300 lb. of L shape, and capable to do a general emergency flying lesson.

The two planes took the air the same day for Clinton where they arrived in 1 hr. 40 min. flying time, then working the state top of 900 ft. in 5 hr. 20 min. flying time.

The Lincoln company's new L-5 plane is adequately adapted to carry passengers and a pilot. The passenger's cockpit is handsomely upholstered in leather and offers very

comfortable place for four. The plane is powered with a 300 hp. Hispano and is recognized as a very practical commercial job.

The Lincoln company exports orders en route that give it every good prospect for its business for the year. In Mexico they are used for mail delivery to Monterrey, in Mexico they are used for payroll transportation to some of the greater safety afforded by air transport against holdups as compared to road transport.

Pilot Reid was in Honduras with the other two planes. There he made many long trips from the coast to Tegucigalpa, the capital, over mountainous terrain. He has made the 500 mi. when otherwise would take days by mail and other means of travel over the mountains. He thus traveled some 3000 mi. over mountainous country without an accident. When the revolution broke out he was offered a small fee from to drop bombs on the capital, but preferred to sell the planes and come back to the states.

Mail Pilots' Flying Time

The amount of flying done by the U. S. Air Mail Service is strikingly illustrated by the following table, which gives the Air Mail pilots' flying time and aggregate mileage as of Apr. 26, 1924:

Name	Age	Miles	Residence
Allison, F. M.	31	192,512	North Haven, N. Y.
Anderson, C. M.	30	102,641	Fort Riley, Kan.
Barnardis, L. E.	30	87,541	Fort Riley, Kan.
Barnardis, Louis M.	24	107,461	Kansas City, Mo.
Barnardis, Louis C.	24	104,214	Kansas City, Mo.
Barnardis, Louis H.	24	104,000	Kansas City, Mo.
Barnardis, Louis N.	24	124,000	Kansas City, Mo.
Barnardis, Louis P.	24	120,000	Kansas City, Mo.
Barnardis, Louis R.	24	120,000	Kansas City, Mo.
Barnardis, Louis S.	24	120,000	Kansas City, Mo.
Barnardis, Louis T.	24	120,000	Kansas City, Mo.
Barnardis, Louis V.	24	120,000	Kansas City, Mo.
Barnardis, Louis W.	24	120,000	Kansas City, Mo.
Barnardis, Louis X.	24	120,000	Kansas City, Mo.
Barnardis, Louis Y.	24	120,000	Kansas City, Mo.
Barnardis, Louis Z.	24	120,000	Kansas City, Mo.
Barnardis, Louis A.	24	120,000	Kansas City, Mo.
Barnardis, Louis B.	24	120,000	Kansas City, Mo.
Barnardis, Louis C.	24	120,000	Kansas City, Mo.
Barnardis, Louis D.	24	120,000	Kansas City, Mo.
Barnardis, Louis E.	24	120,000	Kansas City, Mo.
Barnardis, Louis F.	24	120,000	Kansas City, Mo.
Barnardis, Louis G.	24	120,000	Kansas City, Mo.
Barnardis, Louis H.	24	120,000	Kansas City, Mo.
Barnardis, Louis I.	24	120,000	Kansas City, Mo.
Barnardis, Louis J.	24	120,000	Kansas City, Mo.
Barnardis, Louis K.	24	120,000	Kansas City, Mo.
Barnardis, Louis L.	24	120,000	Kansas City, Mo.
Barnardis, Louis M.	24	120,000	Kansas City, Mo.
Barnardis, Louis N.	24	120,000	Kansas City, Mo.
Barnardis, Louis O.	24	120,000	Kansas City, Mo.
Barnardis, Louis P.	24	120,000	Kansas City, Mo.
Barnardis, Louis Q.	24	120,000	Kansas City, Mo.
Barnardis, Louis R.	24	120,000	Kansas City, Mo.
Barnardis, Louis S.	24	120,000	Kansas City, Mo.
Barnardis, Louis T.	24	120,000	Kansas City, Mo.
Barnardis, Louis V.	24	120,000	Kansas City, Mo.
Barnardis, Louis W.	24	120,000	Kansas City, Mo.
Barnardis, Louis X.	24	120,000	Kansas City, Mo.
Barnardis, Louis Y.	24	120,000	Kansas City, Mo.
Barnardis, Louis Z.	24	120,000	Kansas City, Mo.

Instrument for Direct Course Flying

A compass, by itself, is of little value when flying as straight as possible, as it is practically impossible for a pilot to hold his ship on a straight course, and a compass will only indicate correctly during straight flight as on very wide turns. My flying is very different, however, as I fly straight, following a compass, and the instrument does not indicate correctly during turns, which shows the slight discrepancy between the compass, which points to the north, and the compass with direction, position. A direct course is indicated by steering so as to keep the indicator in the central position. Used in conjunction with the bank indicator, the pilot is able to maintain a laterally level attitude while flying straight, and to bank at the proper angle when turning.

The Finney True Indicator, which is used on the airplanes of the Army, Navy and Air Corps, has been developed to its present stage of perfection, and exhibits the combined effects of the Sperry Gyroscopic Co., the Leverett Sperry Aircraft Co. and the Posse Instrument Co. The latter company is now the exclusive manufacturer of these instruments, holding licenses under Sperry patents of Feb. 21 and Oct. 24, 1923. The True Indicator is also patented in France and Great Britain, and other patent applications are pending.

Illuminated circular will be mailed upon request.

UNITED STATES AIR FORCES

U. S. ARMY AIR SERVICE

Enlisted Men Make Long Airplane Flight

A long enlisted flight was made early in the year by Staff Sergeant P. F. Coffey and T. Joseph Kelly, A.R., stationed at Brooks Field, San Antonio, Tex. They made their flight across the United States from Brooks Field, Tex., to Boston, Mass., and return, covering a total distance of 4138 mi. in a flying time of 48 hr. 15 min.

The route flown over was: Dallas, San Antonio to Dallas, Tex.; Mesquite, Okla.; Beloit, Ill.; Marion, Ind.; Indianapolis, Ind.; Indianapolis, Ind.; Washington, D. C.; New York City; and Boston, Mass. On the return trip the fliers returned their route to the eastbound that, instead of flying direct from Brooks to Mesquite, a stop was made at Kansas City, Mo.

The report on this flight, rendered by Staff Sergeant Coffey, gives full and considerable detail on flying conditions encountered en route—sunny, hazy, fog, rain, snow, temperature, etc. An idea of wind conditions encountered may be gained from the fact that the speed of 303 mi. from Mesquite to Indianapolis was made in 1 hr. 50 min., while the return trip from Kansas City to Mesquite, the return trip required 4 hr.

On the outward trip a forced landing was made near El Dorado Springs, Mo. Due to a leak in the water line connection after making the necessary repairs they were forced to remove a portion of a fairlead, fly low and using full motor and tank or fuel controls under each wing managed to land with one tank and one fairlead and border ground and found successful take off. Reduction in weight was the principal factor in getting them off the ground. During the flight, however, the engine trouble there caused the engine to stop. On their return trip, where the overwing pipe was disconnected and a new radiator fitting installed. With this adjustment their radiator troubles ended.

Army Air Orders

May 10 (Continued).—Bengaluru, India.—Major General G. A. S. L., released from duty as Inspector General—Department Troops June 28, to command Headquarters—March 28, after service in India, to be succeeded by Major General W. E. Clegg, who would leave in First Lieutenant John T. York, Jr., A.S.C., officer in arrival in New York and terminating in time to enable him to report from Field by Sept. 15.

Following named A.R. officers relieved from duty as students at Engineering School, McCook Field, as completion of course, to report for duty in June 15 to C.O., that station: Captain Edward Langford and Lieutenant Leo A. Watson, First Lieutenant Wallace H. Fleischer, George W. Polk and Alexander Peacock.

First Lieutenant Harry R. Dolley, A.R., from duty as student at Engineering School, McCook Field, on completion of course, to duty Office, C.A.N., Washington, by Aug. 25.

Mr. Bryan Q. Jones, A.R., appointed to board for study of proposed aerial law for Philippines Islands.

Production at Wilbur Wright Field

During the last half of March the production of airplanes and engines at the Repair Shops at Wilbur Wright Field, Fairfield, Ohio, was maintained at a high level. The following has been reported as completed: 4 DHAB's, 2 DHAB-1's (aircraft), 2 2885, 8 Liberty engines, 7 Wright 1, 2 Wright A and 6 Wright AE. Thus the total for the efficiency period was eleven planes and twenty-three engines.

San Antonio Air Depot

During the month of March the Engineering Department of the San Antonio Air Intermediate Depot, Kelly Field, Tex., repaired, remodeled or reconstructed 15 DHAB's, 2 DHAB-1's, 1 DHAB, 1 THM-2M, 2 NMB's, 2 JNHE's, 1 analerous plane, 1 Liberty 12A engine and 6 Wright E engines.

Van Veghten's Funeral

A long-winded flight was made early in the year by Staff Sergeant P. F. Coffey and T. Joseph Kelly, A.R., stationed at Brooks Field, San Antonio, Tex. They made their flight across the United States from Brooks Field, Tex., to Boston, Mass., and return, covering a total distance of 4138 mi. in a flying time of 48 hr. 15 min.

The route flown over was: Dallas, San Antonio to Dallas, Tex.; Mesquite, Okla.; Beloit, Ill.; Marion, Ind.; Indianapolis, Ind.; Indianapolis, Ind.; Washington, D. C.; New York City; and Boston, Mass. On the return trip the fliers returned their route to the eastbound that, instead of flying direct from Brooks to Mesquite, a stop was made at Kansas City, Mo.

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Naval Air Stations to Train Reserves

Plans have been previously completed for the advanced training of a large number of student aviators of the Reserve Force at the Naval Air Station at Hampton Roads. Upon completion of their course said d recommended by the Commanding Officer of the Naval Air Station at Hampton Roads and to the Commandant of their Naval District will be recommended as Ensigns, Reserve Forces, and designated Naval Aviators.

The Air Service and Repair offices on the station have been turned over to a training school. Lieut. Comdr. G. A. Smith, U.S.N., will be officer-in-charge of the training. In addition to the student aviators to be trained at the station, preparations have been made for the training of commissioned officers in the Reserve Force. Forty-five of these officers were transferred to the Naval Air Station at Hampton Roads during December.

Fleet airmen have been set aside in the Flight Department of the Naval Air Station at San Diego, Calif., for the training of Naval Reserve Aviators. On the first Friday those reserve pilots reported for duty. The pilots will be given the regular training as far as the Ju 52s permit.

Besides the two above mentioned stations, instruction for Naval Reserve Aviators who are able to reach the stations will be given at all Naval Air Stations.

Naval Air Ordinances

On May 10 (Continued).—Lieut. Theodore H. Hoff, det. Nav. Air Sta., Pensacola, Fla., to swap duty, Det. No. 2, Brooks, Hampton Roads, Va. Lt. (jg) William M. Hunter, det. Nav. Air Sta., Pensacola, Fla., to swap duty, Det. No. 2, Brooks, Hampton Roads, Va. Lt. (jg) Andrew T. Lawrence, det. Nav. Air Sta., Pensacola, Fla., to swap duty, Det. No. 2, Brooks, Hampton Roads, Va. Lt. (jg) Arthur L. Mean, det. Nav. Air Sta., Pensacola, Fla., to swap duty, Det. No. 2, Brooks, Hampton Roads, Va. Lt. (jg) Leo F. Pace, det. Nav. Air Sta., Pensacola, Fla., to swap duty, Det. No. 2, Brooks, Hampton Roads, Va. Lt. (jg) Gordon A. Patterson, det. Nav. Air Sta., Pensacola, Fla., to swap duty, Det. No. 2, Brooks, Hampton Roads, Va. Lt. (jg) Bruce Reyle, det. Nav. Air Sta., Pensacola, Fla., to swap duty, Det. No. 2, Brooks, Hampton Roads, Va. Lt. Comdr. Virgil C. Griffin, det. USR. Langley, to Nav. Air Sta., Pensacola, Fla. Lt. (jg) George W. La Mountain, det. USR. Patoka, to Nav. Air Sta., Pensacola, Fla.

One Capt. E. Daemmer, det. Swap. Gympasse Co., Brooklyn, N. Y., to Navy Yard, New York, N. Y.

One Capt. E. Daemmer, det. Swap. Gympasse Co., Brooklyn, N. Y., to Navy Yard, New York, N. Y.

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Shenandoah Almost Ready

The tailoring, refining and painting of the outer cover of the great airship Shenandoah at the Naval Air Station at Lakehurst, N. J., was 90 per cent completed on April 26. With the exception of some work remaining to be done on the tail fin and rudder, the structural repair on the ship has been completed. It is expected that the Shenandoah will be ready for flight in the middle of May.



Lieut. E. M. Peters, A.S.C.,

standing in front of the Boeing MB3A pursuit plane in which he made a speed of 374.7 mi./hr. over a 45 mi. course at the air circuit of San Antonio, Tex.

A Fast Flight

Nine hours from Seattle, Wash., to San Diego, Calif. by way of the flying route recently made by Lieut. G. H. Wash, U.S.N., Lieutenant Wash flew a standard Navy De Havilland plane and covered the 1200 mi. at an average speed of 133 mi/hr., an exceptional performance.

The fast time is attributed to the superior type of aircraft design employed. Lieutenant Wash is an experienced navigator having served as co-pilot on many flights and on one Arctic air expedition. He was also successful in obtaining the only photographs of the sun's corona made from a Naval plane last September. His knowledge of atmospheric conditions was drawn upon to select a series of air which would give him a continuously favorable wind over the entire flight. Averaging more than a mile and a half above the earth Wash covered a total of 40 mi. in the direction of the coast, which he followed throughout his route. The time of the fastest reported flight of 10 hr. had required to travel from Seattle to San Diego by rail, the best through service requiring 51 hr. One step was made for reduction of San Francisco.

Tent of Water Recovery Apparatus Satisfactory

The first reports from the tests of the water recovery apparatus at the Naval Aircraft Factory at Philadelphia, for use on the seaplane Shenandoah indicate that as a condenser in the vapor form oxygen exhaust this apparatus is completely successful. At three different air speeds, with the engine upon which the trials were made operating at 330 hp., the recovery of water was about 16 per cent greater than the weight of fuel burned.

The water recovery apparatus will be installed on the seaplane of the airship Shenandoah to condense the water vapor from the exhaust of the engine. The water recovered will compensate for the loss in weight suffered through the consumption of fuel.

In an attempt to minimize the consumption of weight apparatus is first important in order to avoid the necessity for releasing some of the helium gas held within the ship in order to reduce its weight. The weight of the ship caused through the expenditure of fuel. The saving of the gas means a wider operating range for the number, at least one.

Naval Air Station, Lakeland

The Naval Air Station at Lakeland, Fla., has been functioning from one to three officers in work as required on the construction of a hangar and maintenance equipment for the Atlantic and New England States. During the week ending April 22, 1934, J. H. Klein, Commanding Officer of the station, addressed the Veterans of Foreign Wars at Lakeland, and Lieut. R. J. Miller addressed a boy's school festival at Germantown,

CALENDAR OF AERONAUTICAL EVENTS

- March 23. Start of the British World Flight, Southampton, England.
- April 6. Start of World Flight of the U. S. Army Air Service, Seattle.
- June 3-17. International Aircraft Exposition, Prague, Czechoslovakia.
- June 15. Gordon Bennett International Balloon Race, Brussels, Belgium.
- June 21. Annual F.A.I. Conference, Paris, France.
- June 22. Commodore Biennale International Cup Race for high speed airmen, Issy, France.
- July 5-6. Zenith International Airplane Efficiency Race, Paris, France.
- August. "Tour de France des Aviateurs," International Round-France race for light airplanes.
- Oct. 2-4. International Air Races, Ind. Palmer Trophy Race, Dayton, Ohio.
- Oct. 24-25. Schneider Cup Race, Baltimore.
- Dec. 17. Twenty-first anniversary of the first successful airplane flight.

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